

Application No. 10/688,364
Amendment A dated March 20, 2006
Reply to Office Action mailed November 22, 2005

AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. **(Currently Amended)** An optical attenuator comprising:

 at least one polarizing element having an optical polarization axis, wherein the polarizing element transmits a portion of an incident light signal proportional to the angular difference between an optical polarization axis of the incident light signal and that of the polarizing element; and

 a variable faraday rotator including:

 a semi-transparent material;

 a magnetic material for applying a magnetic force to a light signal that is passed through the semi-transparent material; and

 a conductive wire disposed around at least a portion of the semi-transparent material and configured to induce a magnetic field on the magnetic material when a current is passed through the conductive wire.
2. **(Original)** The optical attenuator of claim 1, wherein the polarizing element comprises a polarizer having a linear optical polarity.
3. **(Original)** The optical attenuator of claim 1, wherein the semi-transparent material comprises a garnet.

Application No. 10/688,364
Amendment A dated March 20, 2006
Reply to Office Action mailed November 22, 2005

4. (Original) The optical attenuator of claim 1, wherein the magnetic material comprises a hard ferromagnetic material.
5. (Original) The optical attenuator of claim 1, wherein the semi-transparent material is at least partially enclosed in the magnetic material.
6. (Original) The optical attenuator of claim 1, wherein the conductive wire is wrapped around the magnetic material.

Application No. 10/688,364
Amendment A dated March 20, 2006
Reply to Office Action mailed November 22, 2005

7. **(Currently Amended)** A laser package comprising:

a laser light source;

a first polarizing element having an optical polarization axis and in optical communication with the laser light source, wherein the first polarizing element transmits a portion of an incident light signal proportional to the angular difference between an optical polarization axis of the incident light signal and that of the first polarizing element;

a variable faraday rotator in optical communication with the first polarizing element and including:

a semi-transparent material;

a magnetic material configured to apply a magnetic force to a light signal that is passed through the semi-transparent material; and

a conductive wire disposed around at least a portion of the semi-transparent material and configured to induce a magnetic field on the magnetic material when a current is passed through the conductive wire; and

a second polarizing element having an optical polarization axis and in optical communication with the variable faraday rotator, wherein the second polarizing element transmits a portion of an incident light signal proportional to the angular difference between an optical polarization axis of the incident light signal and that of the second polarizing element.

8. **(Original)** The laser package of claim 7, wherein the laser light source comprises a semiconductor laser or a gas laser.

Application No. 10/688,364
Amendment A dated March 20, 2006
Reply to Office Action mailed November 22, 2005

9. (Original) The laser package of claim 7, wherein the laser light source comprises a distributed feedback laser.
10. (Original) The laser package of claim 7, wherein the polarizing elements each comprise a polarizer having a linear optical polarity.
11. (Original) The laser package of claim 7, wherein the semi-transparent material comprises a garnet.
12. (Original) The laser package of claim 7, wherein the magnetic material comprises a hard ferromagnetic material.
13. (Original) The laser package of claim 7, wherein the semi-transparent material is at least partially enclosed in the magnetic material.
14. (Original) The laser package of claim 7, wherein the conductive wire is wrapped around the magnetic material.
15. (Original) An optical transceiver package comprising the laser package of claim 7.

Application No. 10/688,364
Amendment A dated March 20, 2006
Reply to Office Action mailed November 22, 2005

16. (Currently Amended) A laser package comprising:

a laser light source;

a first polarizing element having an optical polarization axis and in optical communication with the laser light source, wherein the first polarizing element transmits a portion of an incident light signal proportional to the angular difference between an optical polarization axis of the incident light signal and that of the first polarizing element;

a faraday rotator in optical communication with the first polarizing element and including:

a semi-transparent material; and

a magnetic material at least partially surrounding the semi-transparent material and configured to apply a magnetic force to a light signal that is passed through the semi-transparent material;

a second polarizing element having an optical polarization axis and in optical communication with the faraday rotator, wherein the second polarizing element transmits a portion of an incident light signal proportional to the angular difference between an optical polarization axis of the incident light signal and that of the second polarizing element;

a variable faraday rotator in optical communication with the second polarizing element and including:

a semi-transparent material;

a magnetic material configured to apply a magnetic force to a light signal that is passed through the semi-transparent material; and

Application No. 10/688,364
Amendment A dated March 20, 2006
Reply to Office Action mailed November 22, 2005

a conductive wire disposed around at least a portion of the semi-transparent material and configured to induce a magnetic field on the magnetic material when a current is passed through the conductive wire; and

a third polarizing element having an optical polarization axis and in optical communication with the variable faraday rotator, wherein the third polarizing element transmits a portion of an incident light signal proportional to the angular difference between an optical polarization axis of the incident light signal and that of the third polarizing element.

17. (Original) The laser package of claim 16, wherein the laser light source comprises a semiconductor laser or a gas laser.

18. (Original) The laser package of claim 16, wherein the laser light source comprises a distributed feedback laser.

19. (Original) The laser package of claim 16, wherein the polarizing elements each comprise a polarizer having a linear optical polarity.

20. (Original) The laser package of claim 16, wherein the semi-transparent materials comprise garnet.

Application No. 10/688,364
Amendment A dated March 20, 2006
Reply to Office Action mailed November 22, 2005

21. **(Original)** The laser package of claim 16, wherein the magnetic material of the faraday rotator comprises a permanent magnet or a premagnetized hard ferromagnetic material.
22. **(Original)** The laser package of claim 16, wherein the magnetic material of the variable faraday rotator comprises a hard ferromagnetic material.
23. **(Original)** An optical transceiver package comprising the laser package of claim 16.

Application No. 10/688,364
Amendment A dated March 20, 2006
Reply to Office Action mailed November 22, 2005

24. **(Currently Amended)** A laser package comprising:

a laser light source;

a first polarizing element having an optical polarization axis and in optical communication with the laser light source, wherein the first polarizing element transmits a portion of an incident light signal proportional to the angular difference between an optical polarization axis of the incident light signal and that of the first polarizing element;

a faraday rotator in optical communication with the first polarizing element and including:

a semi-transparent material; and

a magnetic material at least partially surrounding the semi-transparent material and configured to apply a magnetic force to a light signal that is passed through the semi-transparent material;

a variable faraday rotator in optical communication with the faraday rotator and including:

a semi-transparent material;

a magnetic material configured to apply a magnetic force to a light signal that is passed through the semi-transparent material; and

a conductive wire disposed around at least a portion of the semi-transparent material and configured to induce a magnetic field on the magnetic material when a current is passed through the conductive wire; and

a second polarizing element having an optical polarization axis and in optical communication with the variable faraday rotator, wherein the second polarizing element

Application No. 10/688,364
Amendment A dated March 20, 2006
Reply to Office Action mailed November 22, 2005

transmits a portion of an incident light signal proportional to the angular difference between an optical polarization axis of the incident light signal and that of the second polarizing element.

25. (Original) The laser package of claim 24, wherein the laser light source comprises a semiconductor laser or a gas laser.

26. (Original) The laser package of claim 24, wherein the laser light source comprises a distributed feedback laser.

27. (Original) The laser package of claim 24, wherein the polarizing elements each comprise a polarizer having a linear optical polarity.

28. (Original) The laser package of claim 24, wherein the semi-transparent materials comprise garnet.

29. (Original) The laser package of claim 24, wherein the magnetic material of the faraday rotator comprises a permanent magnet or a premagnetized hard ferromagnetic material.

30. (Original) The laser package of claim 24, wherein the magnetic material of the variable faraday rotator comprises a hard ferromagnetic material.

Application No. 10/688,364
Amendment A dated March 20, 2006
Reply to Office Action mailed November 22, 2005

31. (Original) An optical transceiver package comprising the laser package of claim 24.

Application No. 10/688,364
Amendment A dated March 20, 2006
Reply to Office Action mailed November 22, 2005

32. (Amended) A method of attenuating a light signal, comprising:

directing a light signal from a laser light source to a first polarizing element having an optical polarization axis;

transmitting at least a portion of the light signal proportional to the angular difference between an optical polarization axis of the light signal and that of the first polarizing element to a first faraday rotator;

transmitting at least a portion of the light signal proportional to the angular difference between an optical polarization axis of the light signal and that of the first polarizing element to a second variable faraday rotator; and

directing the light signal from the variable faraday rotator to a second polarizing element.

33. (New) The optical attenuator of claim 1, wherein the semi-transparent material has a substantially cylindrical shape having a central axis.

34. (New) The optical attenuator of claim 33, wherein the semi-transparent material passes the light signal along the semi-transparent material's axis.

35. (New) The optical attenuator of claim 33, wherein the magnetic material is wrapped around an outer perimeter of the semi-transparent material and the conductive wire is wrapped around an outer perimeter of the magnetic material.

36. (New) The optical attenuator of claim 32, further comprising:

Application No. 10/688,364
Amendment A dated March 20, 2006
Reply to Office Action mailed November 22, 2005

directing the light signal from the variable faraday rotator to a third polarizing element, the third polarizing element located between the first faraday rotator and the variable faraday rotator.